linear matrix image 4 is stored as an image file maintained in a memory 114 of the server 110a. The image file may be in a variety of file formats known in the art, including but not limited to JPG, GIF, TIF, and BMP formats.

A web page generator 34 generates code for a web page 36 that is linked to or associated with the encoded linear matrix image 4. The code for the web page 36 may be HTML, XML, or the like. The linkage is preferably implemented by specifying in the code for the web page 36 the file path for the file containing the encoded linear matrix image 4. For example, in HTML the "IMG SRC" keyword could be used to specify the file path. The web page generator 34 could be a manual process that constructs a static web page 36, such as a "Firmware Upgrade" web page for the peripheral 130 that a user of the host 120 would browse to. Alternatively, the web page generator 34 could be a module which dynamically builds a web page 36 tailored to a specific peripheral 130 by having the host 120 query the printer to determine whether or not the peripheral is running the current version of its firmware.

Considering now in further detail a first embodiment of the host 120, and as best understood with reference to FIG. 4, the encoded linear matrix image 4 and the web page 36 are provided to a web page renderer 42 of the image data channel 40 of a host 120a coupled to the server 110a. The web page renderer 42 is typically part of a web browser, such as Netscape Navigator or Microsoft Internet Explorer, and processes the web page code in order to form an image of the web page that is suitable for sending to the peripheral 130. In the preferred embodiment where the peripheral 130 is a printer, the

rendered 42 would typically be activated by the operator of the host 120 selecting a "print" operation.

In rendering an image file, such as the encoded linear matrix image 4, that is associated with the web page 36, the renderer 42 may perform a variety of transformations of the image 4. The image 4 may be scaled in the X or Y directions; for example, a 100 by 100 pixel block in the image 4 may be rendered on the printer as a 50 by 75 pixel block. Certain colors present in the image 4 may be mapped to somewhat different colors of the printer, in order to reduce the total number of colors that need to be rendered or to match the color-producing capabilities of the printer. In order to speed up data transfers between the host 120 and the printer - particularly with a slow host 120 such as a Web TV console - the image 4 may be downsampled to send only a portion of the image 4, such as every other pixel, to the printer. Alternatively, the image 4 may be compressed in a lossy way prior to transmission to the printer. If the image 4 is too large to fit on a single page, it may be clipped, or transformed into a multi-page image by pagination in the X and/or Y directions. Margins may be added on all sides of each page. Different ones of these transformations can be done by different browsers, while other browsers don't perform any transformations at all.

The result of the abovementioned transformations performed by the renderer 42 is to form a rendered web page which includes a partially-transformed linear matrix image 44 which is in turn provided to a print driver 46. The print driver 46, which is also activated as a result of the operator selecting the "print" operation, may perform additional

transformations. The print driver 46 may smooth the image to further speed up the data transfers, which typically results in a further reduction in the number of different colors in the transformed matrix image 6. The print driver 46 then divides the transformed matrix image 6 into swaths, compressing each swath and forming an encapsulated transformed matrix image 48 according to a printer-control language (PCL) protocol known to those in the art.

Considering now in further detail a preferred embodiment of the printer 130, and as best understood with reference to FIG. 5, the encapsulated transformed matrix image 48 is transmitted over the host-peripheral channel 122 and received by the linear matrix decoder subsystem 60 of the printer 130. An encoded linear matrix image detector module 62 removes the PCL encapsulation from the received data, and checks the encapsulated data to determine if the data represents a transformed linear matrix image 6. This determination, as will be discussed subsequently in greater detail, is preferably done by looking for a specific pattern in a header section of the transformed matrix image 6. If the received data is not part of the transformed linear matrix image 6, the detector 62 sends the data to a normal print path processor 63 for printing on the printer 130a. However, if the detector 62 identifies the received data as a transformed linear matrix image 6, and if the matrix image 6 represents binary data consumable by the printer 130a as will also be discussed subsequently, then the transformed linear matrix image 6 is sent to subsequent processing modules 64,66,68 of the decoder subsystem 60.